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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,735	09/29/2005	Guillermo J. Tearney	036217/US/2-475387-00191	6550

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EXAMINER	
TURNER, SAMUEL A	
ART UNIT	**PAPER NUMBER**
2877	

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05/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,735	TEARNEY ET AL.	
	Examiner	Art Unit	
	Samuel A. Turner	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *04 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :9/29/05, 11/21/05, 1/19/06, 2/21/06, 3/17/06, 6/19/06, 8/22/06.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 28 September 2005, 21 November 2005, 19 January 2006, 21 February 2006, 17 March 2006, 19 June 2006, and 22 August 2006 have been considered by the Examiner in accordance with M.P.E.P. 609.05(b).

If applicant is aware of a document or section of a document that is highly relevant to patentability, the Examiner requests that applicant provide a concise explanation of why the English-language information is being submitted and how it is understood to be relevant. This request is made because of the large number of documents submitted, over 800 U.S. Patents, published applications, foreign applications, and literature articles; many of which are lengthy and complex, see MPEP 609.04(a).

M.P.E.P. 609.04(a)

Although a concise explanation of the relevance of the information is not required for English language information, applicants are encouraged to provide a concise explanation of why the English-language information is being submitted and how it is understood to be relevant. Concise explanations (especially those which point out the relevant pages and lines) are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability or where a large number of documents are submitted and applicant is aware that one or more are highly relevant to patentability.

Abstract

The abstract of the disclosure is objected to because the abstract must be limited to single paragraph on a separate sheet within the range of 50 to 150 words. Correction is required. See MPEP § 608.01(b).

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following claimed features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

An interferometer(claims 1, 21-23) including a reference arm(claim 2,), a processing arrangement(claim 2), and a detector(claim 10).

A reference arm(claim 24), a device(claim 24), a spectral separating unit(claim 24), and a detection arrangement(claim 24).

A first arrangement(claim 25), a non-reflective reference arm(claim 25), and a second arrangement(claim 25).

A first arrangement(claim 26), a reference arm(claim 26), and a second arrangement(claim 26).

The drawings are objected to because figures 1-3 are informal. See MPEP § 608.02. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Objections

Claims 10, 19, 20, 25, and 26 are objected to under 37 CFR 1.75(c).

In claim 10, "the first electromagnetic energy" should be -the first electromagnetic radiation-.

Antecedent basis for "the glass" is found in claim 18, not claim 16. The dependencies of claims 19 and 20 should be changed.

In claims 25 and 26, "the electromagnetic radiation" should be -the first electromagnetic radiation- and "the reference" should be -the reference arm-.

NOTE: Applicant is advised that should claim 1 be found allowable, claims 21 and 22 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112, first paragraph

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 25 and 26 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 25 the phrase "wherein a frequency of radiation provided by the first arrangement varies over time" finds support in the specification at page 5, lines 6+, a repetition of claim 25. However, there is no disclosed embodiment, drawing, or subject matter incorporated by reference that describe a frequency variable radiation source. Thus, there is no description provided as to how a frequency variable radiation source can replace the broadband source of a convention source of the OCT of figure 1 and still form the claimed interferences.

In claim 26 the phrase "wherein at least one of the first and second electromagnetic radiation has a spectrum which changes over time, the spectrum containing multiple frequencies at a particular time" finds support in the specification at page 5, lines 18+, a repetition of claim 26. However, there is no disclosed embodiment, drawing, or subject matter incorporated by reference that describe an electromagnetic radiation with a spectrum that varies over time and contains multiple frequencies at a particular time. Thus, there is no description provided as to how such a spectrum is formed or how such a spectrum would form the claimed interferences.

Claim Rejections - 35 USC § 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-26 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The instant application was filed under 35 U.S.C § 371 and claims 1-26 are generally narrative and indefinite. These claims fail to conform with current U.S. practice.

With regard to claims 1, and 21-26; the phrase "an arrangement which facilitates a production of at least two radiations" is indefinite because the claims fail to define whether the "arrangement" produces the "at least two radiations" or merely "facilitates" their production. Therefor the claim does not clearly set forth the metes and bounds of the patent protection desired. Claims 2-20 are dependent from claim 1 and therefor are also included in the rejection.

Claims 1, 11, 21, 22, and 24-26 are indefinite because the language of the claim suggests, implies, or makes optional but does not limit a claim to a particular structure. The phrase "configured to" suggests, implies or makes optional the "delay" but fails to specifically claim the arrangement provides a delay. Therefor the claim does not clearly set forth the metes and bounds of the patent protection

desired. Claims 2-10, and 12-20 are dependent from claim 1 and therefor are also included in the rejection.

Claim 2 is incomplete because there is no defined relationship between the "resultant signal based on the first, second and further radiations" and the "processing arrangement generating a first image based on the first radiation and a second image based on the second radiation", such omission amounting to a gap between the elements. See MPEP § 2172.01. The "resultant signal", as claimed, is created by the interference between the first and further radiations and the second and further radiations. This will produce a single with information about a single point. There is no means for scanning claimed that would provide a plurality of points to form an image. Claims 3-7 are dependent from claim 2 and therefor are also included in the rejection.

Claim 5 refers to variables that have no antecedent basis in claim 5 or the claims from which claim 5 depends. The variables are S_{OCT}(an amplitude of a high-pass filtered OCT signal), m(a thickness of the arrangement), and u_i(an amplitude of a demodulated OCT signal at a spatial location). Claim 5 is dependent from claim 5 and therefor is also included in the rejection.

With regard to claim 8, the phrase "wherein the sample is irradiated by the first irradiation at a first angle, wherein the sample is irradiated by the second radiation at a second angle, the first and second angles different from one another" is indefinite for failing to provide any positively claimed structure that performs the

claimed function(s). Language that does not limit the claim to a particular structure does not limit the scope of the claim. The resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Claim 9 is dependent from claim 8 and therefor is also included in the rejection.

Claim 9 defines the difference between the first angle and the second angle as based on "the delay and at least one of a phase and a incident angle of each of the first and second radiations". Claim 9 is confusing because the first and second angles are the incident angles of the respective first and second radiations.

Claims 14-17 are confusing because there is no positively claimed structure in the "arrangement" for which the limitation of claims 14-17 can be applied. Claim 1 defines "an arrangement" that performs various functions, but provides to specific structure. The first structure claimed that the limitations of claims 14-17 could be applied is found in claim 18, "anti-reflection-coated BK 7 glass".

Claim 24 is confusing because there is no connection between the device, where the first and second radiations interfere with the third radiation; and the spectral separating unit, which separates spectrum of at least one of the first, second and third radiations. There is also no connection between the sample/reference arms and the spectral separating unit. The omission of these connections amounting to a gap between the elements. See MPEP § 2172.01. The phrase "at least one of spectral separating unit" is also confusing because "at least

one of" defines at least two elements while only the "spectral separating unit" is provided.

Claim 26 is indefinite for failing to provide sufficient structure to define the metes and bounds of the patent protection desired. The claim fails to provide any structure capable of generating at least one electromagnetic radiation having a spectrum which changes over time and containing multiple frequencies at a particular time. Language that does not limit the claim to a particular structure does not limit the scope of the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7-10, 21-24, and 26 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Knüttel(5,565,986).

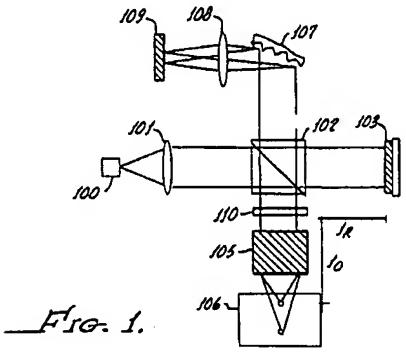


FIG. 1.

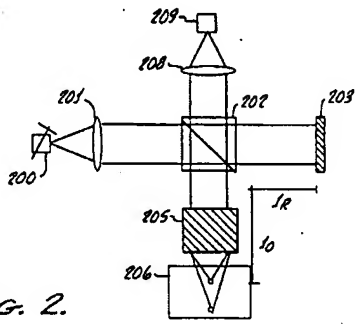


FIG. 2.

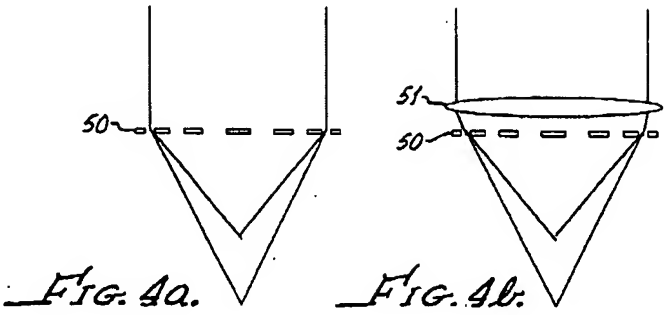


Fig. 4a. Fig. 4b.

With regard to claim 1, Knüttel teaches an apparatus for irradiating a sample(Fig. 1), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 1); and

b) a sample arm receiving the electromagnetic radiation(Fig. 1, l_0), the sample arm including an arrangement(Fig. 1, 105) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(by the difference in pathlength).

As to claim 2/1, further comprising:

c) a reference arm providing a further electromagnetic radiation(Fig. 1, l_R), wherein the interferometer receives the first, second and further radiations, and forms a resultant signal based on the first, second and further radiations(Fig. 1, 109); and

d) a processing arrangement(column 7, lines 11-63) generating a first image based on the first radiation and a second image based on the second radiation,

wherein the first and second images are different from one another(each wavelength forms an image at a specific depth, therefor each image is different).

As to claim 3/2, wherein the processing arrangement generates a further image based on the first and second images(column 7, lines 60-63).

As to claim 4/3, wherein the further image has a noise that is smaller than a noise of the first image and a noise of the second image(column 4, lines 56-61).

As to claim 7/3, wherein the further image is generated based on a mathematical combination of the first and second images(column 7, lines 56-63; each image is spatially summed to provide a 2D or 3D image).

As to claim 8/2, wherein the sample is irradiated by the first irradiation at a first angle, wherein the sample is irradiated by the second radiation at a second angle, the first and second angles different from one another(Fig. 1, 105; the beam angle varies with depth).

As to claim 9/8, wherein the first and second angle are different from one another based on the delay and at least one of a phase and a incident angle of each of the first and second radiations(Fig. 1, 105; delay=pathlength and incident angle=wavelength).

As to claim 10/2, further comprising a detector which detects the first electromagnetic energy, and forwards the detected energy to the processing arrangement(Fig. 1, 109).

With regard to claim 21, Knüttel teaches an apparatus(Fig. 1), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 1); and

b) a sample arm receiving the electromagnetic radiation(Fig. 1, l_0), the sample arm including an arrangement(Fig. 1, 105) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(by the difference in pathlength).

With regard to claim 22, Knüttel teaches an apparatus(Fig. 1), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 1); and

b) a sample arm receiving the electromagnetic radiation(Fig. 1, l_0), the sample arm including an arrangement(Fig. 1, 105) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(by the difference in pathlength).

With regard to claim 23, Knüttel teaches a method for irradiating a sample, comprising the steps of:

a. providing an electromagnetic radiation from an interferometer(column 6, lines 58-62); and

b. in a sample arm, facilitating production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, a first radiation of the at least two radiations being delayed with respect to a second radiation of the at least two radiations(column 9, lines 1-6).

With regard to claim 24, Knüttel teaches an apparatus for imaging(Fig. 1), comprising:

a. a sample arm receiving an electromagnetic radiation(Fig. 1, l_0), the sample arm including an arrangement which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate a sample(Fig. 1, 105), the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(by the difference in pathlength);

b. a device receiving the first and second radiations from the sample arm and at least one third radiation from a reference arm, wherein the first and second radiations interfere with the third radiation(Fig. 1; the interferometer);

c. at least one of spectral separating unit which separates spectrum of at least one of the first, second and third radiations into frequency components(Fig. 1, 107); and

d. at least one detection arrangement including a plurality of detectors, each detector capable of detecting at least a portion of at least one of the frequency components(Fig. 1, 109).

With regard to claim 26, Knüttel teaches an apparatus comprising:

a. at least one first arrangement(Fig. 2, 200) providing at least one first electro-magnetic radiation to a sample arm(Fig. 2, l_0) and at least one second electromagnetic radiation to a reference arm(Fig. 2, l_R), wherein at least one of the first and second electromagnetic radiation has a spectrum which changes over time, the spectrum containing multiple frequencies at a particular time(the bandwidth of the tunable laser), wherein the sample arm receives the first electromagnetic radiation, the sample arm including an arrangement(Fig. 2, 205) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate a sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(by the difference in pathlength); and

b. at least one second arrangement detecting an interference between the first and second radiations generated at the sample arm and the second electro-magnetic radiations generated at the reference(Fig. 2, 209).

Claims 1-3, 7-11, and 21-23 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Li(6,014,214).

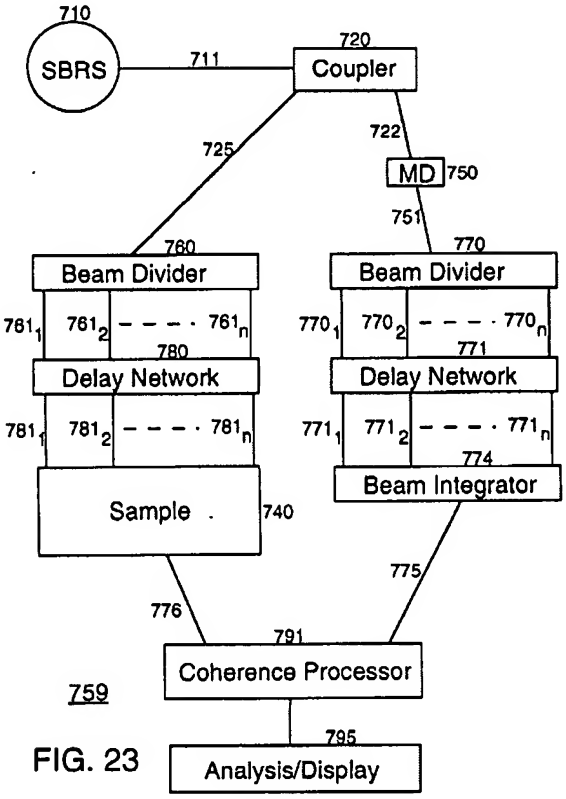


FIG. 23

With regard to claim 1, Li teaches an apparatus for irradiating a sample(Fig. 23), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 23, 759); and

b) a sample arm receiving the electromagnetic radiation(Fig. 23, 725), the sample arm including an arrangement(Fig. 23; 760,780) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of

the at least two radiations with respect to a second radiation of the at least two radiations.

As to claim 2/1, further comprising:

c) a reference arm providing a further electromagnetic radiation(Fig. 23, 722), wherein the interferometer receives the first, second and further radiations, and forms a resultant signal based on the first, second and further radiations(Fig. 23, 791); and

d) a processing arrangement(Fig. 23, 795) generating a first image based on the first radiation and a second image based on the second radiation, wherein the first and second images are different from one another(column 27, line 49- column 28, line 10).

As to claim 3/2, wherein the processing arrangement generates a further image based on the first and second images(column 29, lines 10-15).

As to claim 7/3, wherein the further image is generated based on a mathematical combination of the first and second images(column 29, lines 10-15).

As to claim 8/2, wherein the sample is irradiated by the first irradiation at a first angle, wherein the sample is irradiated by the second radiation at a second angle, the first and second angles different from one another(column 27, lines 61-65).

As to claim 9/8, wherein the first and second angle are different from one another based on the delay and at least one of a phase and a incident angle of each of the first and second radiations(Fig. 23; 760,780; column 27, lines 61-65).

As to claim 10/2, further comprising a detector which detects the first electromagnetic energy, and forwards the detected energy to the processing arrangement(Fig. 23, 791).

As to claim 11/1, wherein the arrangement includes two sections, each being configured to delay a respective one of the first and second radiations, and wherein a delay of the first radiation is greater than a delay of the second radiation(Fig. 23, 780).

With regard to claim 21, Li teaches an apparatus(Fig. 23), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 23, 759); and

b) a sample arm receiving the electromagnetic radiation(Fig. 23, 725), the sample arm including an arrangement(Fig. 23; 760,780) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

With regard to claim 22, Li teaches a probe for optical coherence tomography imaging(Fig. 23), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 23, 759); and

b) a sample arm receiving the electromagnetic radiation(Fig. 23, 725), the sample arm including an arrangement(Fig. 23; 760,780) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

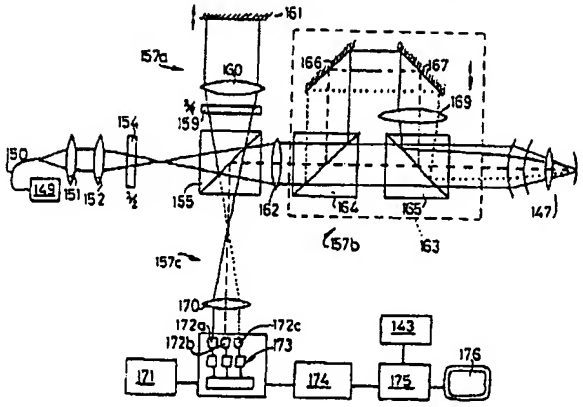
With regard to claim 23, Li teaches a method for irradiating a sample, comprising the steps of:

a. providing an electromagnetic radiation from an interferometer(column 27, lines 39-48); and

b. in a sample arm, facilitating production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, a first radiation of the at least two radiations being delayed with respect to a second radiation of the at least two radiations(column 27, lines 49-65).

Claims 1-3, 7, 10, 11, and 21-23 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Waelti et al(WO 01/38820, all references given below refer to the English translation U.S. 6,806,963).

Fig. 7



With regard to claim 1, Waelti et al teach an apparatus for irradiating a sample(Fig. 7), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 7); and

b) a sample arm receiving the electromagnetic radiation(Fig. 7, 157b), the sample arm including an arrangement(Fig. 7, 163) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

As to claim 2/1, further comprising:

c) a reference arm providing a further electromagnetic radiation(Fig. 7, 157a), wherein the interferometer receives the first, second and further radiations, and forms a resultant signal based on the first, second and further radiations(Fig. 7, 172); and

d) a processing arrangement generating a first image based on the first radiation and a second image based on the second radiation, wherein the first and

second images are different from one another(column 13, line 55- column 14, line 15).

As to claim 3/2, wherein the processing arrangement generates a further image based on the first and second images(column 13, lines 59-61).

As to claim 7/3, wherein the further image is generated based on a mathematical combination of the first and second images(column 13, lines 59-61).

As to claim 10/2, further comprising a detector which detects the first electromagnetic energy, and forwards the detected energy to the processing arrangement(Fig. 23, 172).

As to claim 11/1, wherein the arrangement includes two sections, each being configured to delay a respective one of the first and second radiations, and wherein a delay of the first radiation is greater than a delay of the second radiation(Fig. 7, 163).

With regard to claim 21, Waelti et al teach an apparatus(Fig. 7), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 7); and

b) a sample arm receiving the electromagnetic radiation(Fig. 7, 157b), the sample arm including an arrangement(Fig. 7, 163) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

With regard to claim 22, Waelti et al teach an apparatus(Fig. 7), comprising:

a) an interferometer forwarding an electromagnetic radiation(Fig. 7); and

b) a sample arm receiving the electromagnetic radiation(Fig. 7, 157b), the sample arm including an arrangement(Fig. 7, 163) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

With regard to claim 23, Waelti et al teach a method for irradiating a sample, comprising the steps of:

a. providing an electromagnetic radiation from an interferometer(column 13, lines 17-27); and

b. in a sample arm, facilitating production of at least two radiations from the electromagnetic radiation so as to irradiate the sample, a first radiation of the at least two radiations being delayed with respect to a second radiation of the at least two radiations(column 13, lines 36-41).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. § 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Claims 12-20, and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Knüttel(5,565,986).

As to claim 12/1, Knüttel fails to teach wherein the delay of a path of the first radiation compared to a path of the second radiation is at least 500 μm in air.

As to claim 13/1, Knüttel fails to teach wherein the delay of a path of the first radiation compared to a path of the second radiation is at least 1 mm in air.

As to claim 14/1, Knüttel fails to teach wherein the arrangement has a refractive index of at least 1.5.

As to claim 15/1, Knüttel fails to teach wherein the arrangement has a refractive index of at least 3.0.

As to claim 16/1, Knüttel fails to teach wherein the arrangement includes silicon.

As to claim 17/1, Knüttel fails to teach wherein the arrangement includes an anti-reflective coating on at least one surface thereof.

As to claim 18/1, Knüttel fails to teach wherein the arrangement comprises an anti-reflection-coated BK 7 glass.

As to claim 19/16, Knüttel **fails to teach** wherein the glass has a thickness of from about 1.6 mm to about 7.7 mm.

As to claim 20/16, Knüttel **fails to teach** wherein the glass has a refractive index of from about 1.51 to about 3.5.

With regard to claim 25, Knüttel teaches an apparatus(Fig. 2) comprising:

a. at least one first arrangement(Fig. 2, 200) providing at least one first electro-magnetic radiation to a sample arm(Fig. 2, l_0) and at least one second electro-magnetic radiation to a reference arm(Fig. 2, l_R), wherein a frequency of radiation provided by the first arrangement varies over time, wherein the sample arm receives the first electromagnetic radiation, the sample arm including an arrangement(Fig. 2, 205) which facilitates a production of at least two radiations from the electromagnetic radiation so as to irradiate a sample, the arrangement being configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations(**by the difference in pathlength**); and

b. at least one second arrangement detecting an interference between the first and second radiations generated at the sample arm and the second electro-magnetic radiations generated at the reference(Fig. 2, 209).

Knüttel **fails to teach** a non-reflective reference arm.

CLAIMS 12 and 13:

Knüttel teaches an a large depth of field(column 2, line 67- column 3, line 1), but fails to teach the specific distances of 500 µm or 1 mm.

With regard to claims 12 and 13, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the hologram 50 based on source bandwidth and the sample under test to provide a desired distance(delay) between the minimum and maximum focal points.

The motivation for this would have been the turbidity and absorption of the sample which limits the depth and the bandwidth which defines the wavelength points(see figures 1 and 4b).

CLAIMS 14-16, 19, 20:

Knüttel teaches a focusing device, figure 4b, comprising a lens 51 and a holographic plate 50. This arrangement focuses the incoming beam to different depths dependent on wavelength(column 9, lines 1-6). Knüttel fails to teach the specifics such as the index of refraction of the lens or holographic plate, the material and thickness of the plate, or anti-reflection coatings on the lens or plate.

With regard to claims 14-16, 19, and 20; it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a lens and holographic plate dependent on the source bandwidth and the sample under test.

The motivation for element selection would have been based on refractive index and material, which effects the focal point of the lens and plate based on

Snell's law, and the availability of different holographic plates, usually of glass having a photosensitive film.

CLAIMS 17 and 18:

Official notice is taken that anti-reflection coatings are well known in the interferometer art to eliminate reflections from the various optical elements that may produce unwanted interferences and/or intensity noise. See In re Malcom, 1942 C.D 589; 543 O.G. 440.

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the next Office action will indicate that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate.

With regard to claims 17 and 18, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Knüttel by placing anti-reflection coatings on the lens and/or holographic plate.

The motivation for this modification would have been to eliminate reflections from the lens and plate that may produce unwanted interferences and/or intensity noise.

Allowable Subject Matter

Claims 5 and 6 are rejected under 35 U.S.C. § 112, second paragraph, and not under the art of record, however the claims are so confusing that any statement regarding allowable subject matter would be premature.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit 2877